Patent Claims

1. Stent, comprising an SMP material for use in the non-vascular or vascular field.

2. Stent as claimed in claim 1, wherein the stent comprises a basic structure of a material coated with an SMP material, preferably an SMP material with one or two shapes in the memory.

3. Stent as claimed in one of the preceding claims, further comprising additional additives selected among x-ray contrast substances and medically effective compounds.

4. Stent as claimed in at least one of the preceding claims, wherein the SMP material is selected among polymer networks, thermoplastic SMP materials, composite materials or blends.

5. Stent as claimed in one of the preceding claims, wherein the SMP material is selected among SMP materials in which the SMP effect is induced thermally, it is photo-induced and/or wherein the SMP material is biocompatible and/or haemocompatible.

6. Stent as claimed in one of the preceding claims, wherein the SMP material has values for e-module of 0.5 to 50 MPa and/or an elongation of break of 100 to 1200 % and/or a reset fixation of more than 90 %, preferably more than 92 %, even more preferably more than 95 %, and particularly preferably more than 98 %, and or a reset ratio after five cycles in the thermo-mechanical experiment of more than 90 %, preferably more than 92, even more preferably more than 95 and particularly preferably more than 98 %.

7. Stent as claimed in claim 5, wherein the network includes caprolacton units, pentadecalacton units, ethyleneglycol units, propyleneglycol units, lactic acid units and/or glycol acid units.

8. Stent as claimed in claim 6, wherein the network consists of cross linked caprolactonmacromonomers.

9. Method of manufacturing a stent as claimed in one of the preceding claims, comprising the processing of the SMP material to a stent by extrusion methods, coating methods, metal casting methods or spinning and weaving methods.

10. Kit, comprising a stent as claimed in at least one of claims 1 to 6, and additionally a temperature-controlled balloon catheter and/or a balloon catheter with an optical fibre.

11. Method for the minimal invasive implantation of a stent, comprising the following steps:

- Placing a stent as claimed in one of claims 1 to 7 onto a temperature-controlled balloon catheter or a balloon catheter with an optical fibre,
- Inserting the stent placed in this manner to the desired position,
- Heating the stent by inserting a heating medium into the catheter,
- Expanding the stent to carry out the programming of the SMP material,
- Inserting a cooling medium into the catheter to fix the stent in the expanded condition or introduction of light (preferably UV light) of a suitable wavelength to fix the stent in the expanded state,
- Removing the balloon catheter.

12. Method for removing an implanted stent as claimed in one of claims 1 to 7, comprising the following steps, preferably according to the implantation according to claim 10:

- Inserting a balloon catheter into the implantation location
- Inserting a heat medium into the balloon catheter to heat the stent or introducing light of a suitable wavelength,

- Activating the shape memory effect by heating or the effect of light so that the stent is transferred from its temporary shape into the permanent shape,
- Removing the balloon catheter, together with the stent.

13. Method as claimed in claim 11, further comprising the step of introduction of a cooling medium after introducing the heating medium to cool the stent in the permanent shape, before removing same.

14. Method for the minimal invasive implantation of a stent, wherein the stent is an SMP material with two shapes in the memory, comprising the following steps:

- Placing a stent according to one of claims 1 to 7 onto a temperature-controlled balloon catheter or a balloon catheter with an optical fibre, wherein the SMP material exists in the first temporary shape,
- Inserting the stents placed in this way into the desired position,
- Heating the stent by inserting a heated medium into the catheter or introducing light of a suitable wavelength to obtain the second temporary shape,
- Removing the balloon catheter.

15. Method of removing an implanted stent, wherein the stent comprises an SMP material with two shapes in the memory, comprising the following steps, preferably according to the implantation according to claim 13:

- Inserting a balloon catheter into the implantation location,
- Inserting a heat medium into the balloon catheter to heat the stent or introducing light of a suitable wavelength,
- Activating the shape memory effect by the heating or the effect of light so that the stent is transferred from its second temporary shape into the permanent shape,
- Removing the balloon catheter, together with the stent.